Prompt fission neutron emission in resonance fission of ^{239}Pu

Franz-Josef Hambsch[1], Natallia Varapai[2], Shakir Zeinalov[3], Stephan Oberstedt[1], Olivier Serot[2]

[1] *EC-JRC-Institute for Reference Materials and Measurements, Retieseweg, B-2440 Geel, Belgium*
[2] *CEA Cadarache, DEN/DER/SPRC/LEPh, F-13108 St. Paul-Lez-Durance, France*
[3] *Joint Institute for Nuclear Research (JINR), 141980 Dubna, Moscow Region, Russia*

The prompt fission neutron emission probability is being investigated at the time-of-flight facility GELINA at IRMM. A double Frisch-gridded ionization chamber is used as fission fragment detector. For the data acquisition of both the fission fragment signals as well as the neutron detector signals the fast digitization technique has been applied. For the neutron detection large volume liquid scintillation detectors from the DEMON collaboration are used. A specialized data analysis program taking advantage of the digital filtering technique has been developed to treat the acquired data.

Neutron multiplicity investigations for actinides, especially in resonance neutron induced fission, are rather scarce. They are, however, important for reactor control and safety issues as well as for understanding the basic physics of the fission process. Fission yield measurements on both ^{235}U and ^{239}Pu without prompt neutron emission coincidence have shown that fluctuation of the fission fragment mass distribution exists from resonance to resonance, larger in case of ^{235}U. To be possibly able to explain these observations, the question is now, whether the prompt neutron multiplicity shows similar fluctuations with the resonance energy.

Email: Franz-Josef.Hambsch@cec.eu.int